Fig. 1. Palatine temple of Apollo, view of the remains from the east (author); the concrete nucleus of the *pronaos* (*a*) and the *cella* (*b*) are separated by a large trench (*c*) that contained the ashlar foundations of the *cella* wall (its remains are now accessible underground). The *pronaos* still preserves a series of holes (arrow), which once contained the ashlar foundations of the frontal columns.

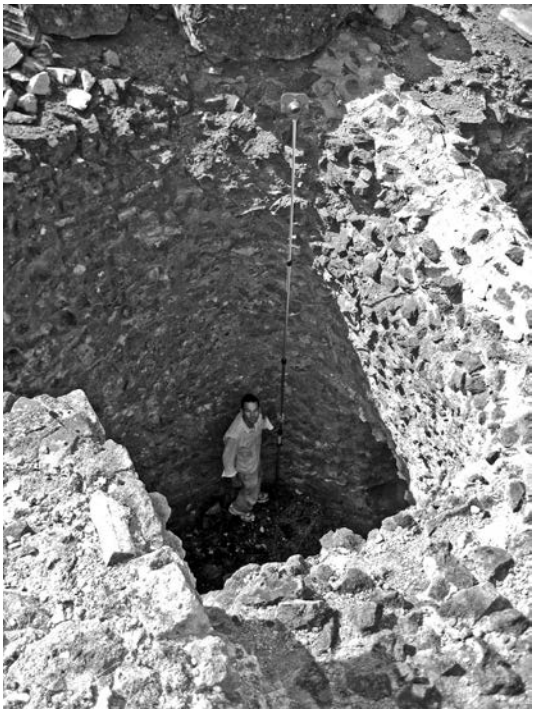

Fig. 2. One of the foundation holes, which indicate the location and orientation of the temple's front (B. Marr). The ashlar blocks of the frontal columns are now mostly robbed and the holes partly filled with débris. Originally the columnar foundations were almost 10 m high and supported marble columns of *c.*15-m height.

Old and new archaeological evidence for the plan of the Palatine temple of Apollo

S. Zink

In answer to T. P. Wiseman's final paragraph, the SW orientation of the Palatine temple of Apollo was never questioned over the last 150 years for a single, good reason: a series of enormous foundation holes indicates the location of the temple's columnar façade. Now *c.*7 m deep but originally almost 10 m, these holes once contained the ashlar blocks of the temple's front colonnade, which featured 6 columns of almost 15 m height, rising to an overall height of about 26 m if we include both podium and pediment (figs. 1-2, 5-7). As the pairs of lateral columns shared a wider set of foundations, the temple preserves 4 foundation holes for the 6 frontal columns. The applied construction technique of the foundations is well known from Late Republican and Augustan temples: massive ashlar walls supported all load-bearing parts (columns and walls), while the spaces in between were filled with *opus caementicium*.[1]

As far as the location and the orientation of the temple's façade are concerned, the otherwise extremely complex archaeology of Octavian's Palatine sanctuary is indeed unusually straightforward. Not surprisingly therefore, most of those who have excavated or documented the temple's archaeological remains — from P. Rosa (1864/65), to G. Boni (1921), G. Lugli (1951), H. Bauer (1968), G. Carettoni (1960s), to myself (since 2006) — never had reason to doubt the temple's SW orientation. Lugli rightly based the first reconstruction of the temple's plan on a documentation of the frontal foundation, and my own reconstruction of the columnar façade followed the same approach. Already in 2008, after carrying out a more precise and detailed documentation of the foundation holes during two weeks of on-site measuring *inside* them, I was able to determine the columnar axial widths of the temple's front more precisely than was previously possible.[2] In conjunction with the documentation of several preserved architectural fragments, this fieldwork also allowed me digitally to reconstruct the façade.[3]

From an archaeological point of view, the SW orientation of the Palatine temple of Apollo has been regarded as a datum since Lugli's work in the 1950s. T. P. Wiseman's

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Frequently cited: Lugli = G. Lugli, "Il tempio di Apollo Aziaco e il Gruppo Augusteo sul Palatino," *Atti Accad. Naz. San Luca* 1 (1951-52) 26-55, reprinted in id., *Studi minori di topographia antica* (1965) 258-90.

Carettoni = G. Carettoni, "I problemi della zona Augustea del Palatino alla luce dei recenti scavi," *RendPontAcc* 39 (1966-67) 55-75.

Zink = S. Zink, "Reconstructing the Palatine temple of Apollo: a case study in Early Augustan temple design," *JRA* 21 (2008) 47-63.

Claridge = A. Claridge, *Rome: an Oxford archaeological guide* (2nd edn., Oxford 2010).

1 See Zink 49 with reference to the temples of Apollo Sosianus and the Augustan Pantheon. In both cases, the foundations of the columnar front were carried out as individual spot foundations in ashlar masonry while the spaces in between were filled with concrete: see A. M. Colini, "Il Tempio di Apollo," *BullCom* 68 (1941) 13 figs. 3-4; L. Beltrami, *Il Pantheon* (Milan 1898) 46, fig. 14.

2 See Lugli 43-46, figs. 5 and 15 (reproduced in Zink 48, fig. 2). For my reconstruction of the columnar front see Zink 51, 55-56, fig. 5 (photograph and detailed plan of the columnar foundation holes) and fig. 10 (reconstructed plan of front on basis of newly-measured foundation holes).

3 Zink 58-61, fig. 12; also S. Zink with H. Piening, "*Haec aurea templa*: the Palatine temple of Apollo and its polychromy," *JRA* 22 (2009) 110, fig. 1.

article above, which follows A. Claridge's novel assertions on the temple's foundations, demonstrates, however, a lingering need for a comprehensive explanation of the temple's structural logic and an examination of its modern restorations and functional parts.[4] In this response, I will focus on the archaeological evidence that concerns the temple plan, as this is the point of departure for Wiseman's new interpretation of the SW Palatine and its historical topography. Over the last 6 years, I have been conducting an on-site documentation through architectural drawings of the extant remains in the area of the sanctuary of Apollo.[5] These drawings add substantially to our knowledge of the temple's construction technique, construction phases, and modern restorations, while providing a new insight into the layout of specific architectural features (such as the temple's columnar orders, the crypt, and the *cella*). The drawings provide the basis for a new reconstruction of the temple's ground plan, which complements my 2008 reconstruction of its façade while replacing my earlier reconstruction of its overall plan, at that time still based in part on Lugli's documentation.[6] The new data confirms the long-held scholarly tenet that the temple faced southwest, demonstrating that Claridge's and Wiseman's interpretation of the temple's layout is incorrect.

Modern restorations and additions

To a large extent, today's appearance of the temple's concrete foundations is the result of restoration and reconstruction work carried out by P. Rosa after the temple's first excavation in 1864/65, then by G. Carettoni in the 1960s, and more recently by the Soprintendenza Archeologica di Roma.[7] In order to assess the temple's plan, it is necessary to separate restored from untreated parts. Modern consolidations and additions were often carried out in characteristic materials such as (modern) bricks, concrete with cement, or re-used pieces of *opus signinum* from the site's débris. A systematic mapping of seam lines and changes of construction material allows us to retrace the interventions of modern conservators (fig. 5 in colour).

Almost all of the W half of the *cella* podium is a modern reconstruction. Rosa must have found this part of the podium largely destroyed, whereas the E half was relatively well preserved. In order to reconstruct the podium's original square shape, he built a wall around the W half of the *cella*, which held in place a fill of earth and rubble. In addition, most parts of the original concrete foundations were consolidated with a layer 20-30 cm thick of *opus caementicium* (now identifiable through seam lines). A stairway was built to allow visitors to access the *cella* foundations by bridging both the foundation holes of the columnar façade and the large trench that still separates the *cella* from the *pronaos* foundations (figs. 1, 3, 5 at *a*). Those 19th-c. restorations represent an interesting piece of site conservation. Although perhaps radical from today's perspective, they were carried out

4 Claridge 142-43, an extended version of an argument that first appeared in her 1998 edition.

5 Since 2009, on-site tachymetric surveys are being carried out in collaboration with architect B. Marr ("Memvier" Denkmalpflege & Bauforschung, Bamberg). The results of the digital survey provided the basis for my hand-drawings at the scale 1 : 50.

6 See Zink 2008, fig. 10 (now confirmed) and fig. 11 (now superseded as far as the temple's flank is concerned).

7 On P. Rosa's work at the temple, see Lugli 34 and, in particular, his notes and letters published in M. A. Tomei, *Scavi francesi sul Palatino. Le indagini di Pietro Rosa per Napoleone III, 1861-1870* (Roma Antica 5, 1999) 141-56 (excavations) and 70-71, 88-89 and 167 (restorations). Plaques with dates also permit the tracing of many of Carettoni's restorations.

Fig. 3. Palatine, temple of Apollo, view in 1872 of the temple after P. Rosa's excavations and restorations (Tomei 1999 [supra n.7] fig. 91). Rosa constructed a stairway over the remains of the *pronaos* to bridge the large foundation trench of the *cella*'s SW wall. Its remains are still preserved (cf. figs. 1 and 5).

with a profound understanding of the ruin's structural logic. Indeed, specific structural elements of the temple were correctly reconstructed. Apart from remodelling the block of the *cella* foundations, Rosa attached a rectangular concrete structure to the E corner of the *cella* to indicate the original extent of the ashlar foundations supporting the *cella* wall and its engaged half-columns (cf. fig. 5 at *b*, fig. 9). Rosa also repositioned 4 ashlar blocks near the S corner of the *cella* to indicate the ashlar foundations of the interior order (cf. fig. 1, fig. 5 at *c*; see below). Further, he consolidated 5 *in situ* blocks within the foundation holes of the columnar front (cf. fig. 5 at *d*). Today, these blocks are not visible above ground, but they are accessible from below through modern cavities, which allowed him to stabilize them from below with iron beams. Finally, he reinstalled a few blocks at the S corner of the temple's stairway and along the E side of the *cella*; they indicate the position of ashlar blocks that once surrounded the concrete nucleus (cf. fig. 5 at *e-f*).[8]

The concrete foundations of both *pronaos* and *cella* contain a series of voids, some of which were vaulted. These areas were the focus of Carettoni's excavations and restorations.[9] He excavated the E half of the *pronaos*, the ashlar foundations around the SW and E side of the *cella*, and dug an archaeological trench (which is still open: see fig. 7) in the southernmost tunnel within the *cella* foundations. The tunnels were covered with a new concrete ceiling (still in place). The ashlar foundations along the SE side of the *cella* were recovered by Carettoni's excavation, and these remains are now located *c.*10-30 cm below surface level; I have uncovered and measured some of these blocks (figs. 4, 5 at *g*). Since the extant ashlar foundations at the SW side of the *cella* were preserved on a much lower level, Carettoni covered them with an armored concrete ceiling. These ashlar foundations, now accessible underground, indicate the location of the *cella*'s SW wall (cf. figs. 4, 5 at *a*, 7 at *a*).[10]

Overall, ancient surfaces are preserved mostly in the area of the *pronaos* and at isolated locations around the *cella*. Three corners (N, S, E) of the *cella*'s concrete nucleus are also *in*

8 Lugli (34) already noted that the ashlar blocks at the SE side of the *cella* were an addition of P. Rosa; on the blocks repositioned at the E corner of the *cella*, see the remark by Lugli (35): "per alcuni viene il dubbio che no si trovino nel luogo originale".

9 Carettoni 69-72, fig. 9.

10 Claridge (142) seems to believe that the trench which separated the *pronaos* and the *cella* was a "robber trench" and to lack a specific structural function. She appears not to be aware of the surviving ashlar foundations in this trench, although they appear on several plans after Carettoni's excavations, most recently on the plan of I. Iacopi and G. Tedone, "Biblioteca e Porticus ad Apollinis," *RömMitt* 112 (2005-6) pl. 7 (partly reproduced in Zink fig. 4).

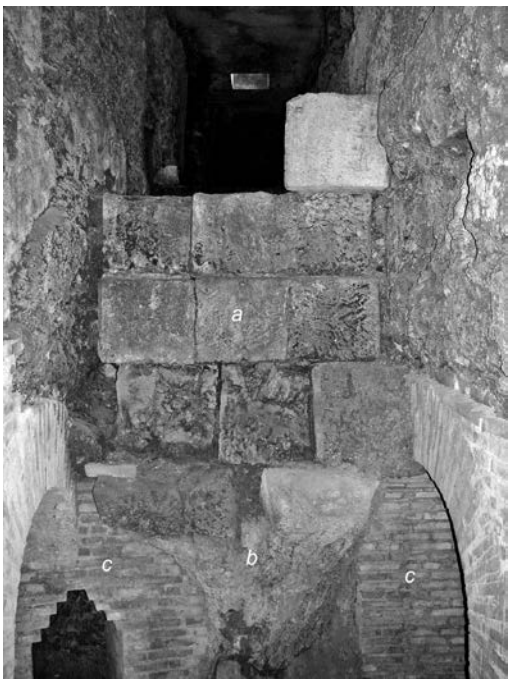

Fig. 4. Palatine, temple of Apollo, remains of the ashlar foundations that surrounded the concrete nucleus of the *cella* to support its walls and engaged columns (author).
Above: *in situ* blocks along the SE side of the *cella* (*a*) overbuilt by restorations of P. Rosa (*b*).
Right: *in situ* blocks (*a*) of the SW *cella* wall on top of bedrock (*b*) and next to modern restorations (*c*) carried out by G. Carettoni in the 1960s (for the location of these remains see figs. 5 at *g*, *f*; fig. 7 at *a*).

situ, and they are crucial for reconstructing the temple's ground plan (cf. fig. 5). In these locations we can observe that the original *opus caementicium* consisted of light grey mortar with large amounts of black and red *pozzolana,* a mixture that is typical for the Augustan period.[11] Depending on the area, different aggregate materials were used with an eye to strength and stability of the concrete: most of the foundations contain rather consolidated stones such as a brownish-orange Tufo Lionato (diam. of chunks *c.*10-30 cm) and pieces of travertine (re-used from earlier buildings); the vaults of the spaces inside the podium feature homogeneous chunks of yellow tufa (either Tufo Giallo della Via Tiberina or Tufo Giallo di Prima Porta).[12] The identification of these untreated surfaces provides the point of departure for the following reconstruction of the temple's ground plan.

Reconstructing the plan

A full mapping of the temple foundations (plans and sections) carried out between 2009 and 2012 confirmed my previous reconstruction of the temple's frontal facade while shedding new light on the columnar spacing of its flanks. The axial width of the lateral columns is now about 27 cm shorter than I had reconstructed on the basis of Lugli's documentation,[13] which means that the exterior columnar order featured three different intercolumniations.

My new reconstruction of the columnar spacing on the flanks depends upon the following structural factors, which allow us to determine the position of 4 columns (cf. fig. 6):

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11 I wish to thank L. C. Lancaster for her kind expertise (based on photographs); on the Augustan *opus caementicium* see her *Concrete vaulted construction in Imperial Rome* (Cambridge 2009) 55-56, with reference to E. B. Van Deman, "Methods of determining the date of Roman concrete monuments," *AJA* 16 (1912) 251.

12 The identification of the aggregate material is preliminary pending scientific analysis. My nomenclature follows M. Jackson and F. Marra, "Roman stone masonry: volcanic foundations of the ancient city," *AJA* 110 (2006) 406 (Table 1) and 432-34.

13 See Zink 56, now superseded by new results.

- As established in my 2008 plan, the foundation holes of the frontal columns fix the SW orientation of the temple's front. Five newly-documented ashlar blocks inside the eastern-most hole provide confirmation for the SW axis of the frontal columns (cf. fig. 5 at *d*).[14]
- Three corners (N, S, E) of the *cella's* concrete nucleus are preserved *in situ* (cf. fig. 5 elevation views), corresponding to the position of the ashlar foundations that supported the three-quarter columns at corners of the *cella*. The ashlar blocks of the *cella*'s SW wall (cf. figs. 4 right at *a*, 5 at *a*, 7 at *a*) indicate the thickness of the *cella* wall, to which that column was attached.[15]
- The ashlar foundations along the E side of the *cella* (cf. figs. 4, 5 at *g*) fix the E limit of the columnar foundations, together with other remains of ashlar foundations (fig. 5 at *a*, *d*). The load-bearing columns can not have projected beyond the limit of these foundations.

This data, combined with my 2008 reconstruction, allows one graphically to determine the position of the three-quarter columns engaged to the N, S and E corners of the *cella*. With 10 columns on the side (the only possible number given the distances between the fixed columns), we arrive at a width of 3.92 m ± 2 cm for the temple's lateral columns. The exterior columnar order therefore featured three intercolumniations, which differ by about 16-18 cm, or about half a Roman foot:

central intercolumniation of the front: 4.28 m ± 2 cm (cf. Zink 2008);
regular intercolumniation of the front: 4.12 m ± 2 cm (cf. Zink 2008);
intercolumniation of the side: 3.92 m ± 2 cm (newly established)

This layout resulted in an almost square interior space of the *cella* of *c.*21.33 x 18.88 m (402.7 m^2). In conjunction with a lower columnar diameter of 152 ± 2 cm (cf. Zink 2008, based on a preserved column drum), we can establish the columnar ratios of the plan as:

CD : IC (front, center)	*CD : IC (front, regular)*	*CD : IC (sides)*
1 : 1.815 (± 0.05)	1 : 1.71 (± 0.05)	1 : 1.58 (± 0.05)
(7: 13?)	(7 : 12?)	(7 : 11?)

where CD = (lower) column diameter; IC = Intercolumniation (clear spacing)

Several new architectural features can now be added to the temple's ground plan; they also explain the function of the voids and recesses in the concrete foundations, which play a key rôle in Claridge's comments on the temple's plan:

Foundations of the cult statue base (cf. figs. 5, 6, 7 at *b*, 8 at *c*): A rectangular recess located at the NE end of the *cella* indicates an architectural element that extended along the *cella* wall. The location at the far end of the *cella* and in the main axis of the temple suggests that these are the remains of the base for the cult images. It measured *c.*10.5 x 2 m and carried statues of Apollo, Diana and Latona (Plin., *NH* 36.24-25 and 32).

Foundations of the temple's interior colonnade (figs. 1, 3, 6, 9, 10): A recess (w *c.*1.60 m; h *c.*1 m), in the concrete along the interior side of the *cella* still contains three ashlar blocks in their original position (the corresponding blocks at the SE corner of the *cella* are a correct restoration of P. Rosa). It is most likely that these are the foundations for a podium that supported the columns of the interior colonnade.

Voids in the foundations of the pronaos (figs. 5 at *h-i*, 7 at *d*): In addition to the foundation holes of the columnar façade, the concrete foundations of the *pronaos* featured two large

14 My figs. 5-6 (top views of the ruins) do not show the outline of these blocks since they are located below ground level. The blocks are accessible today through a modern cavity and were documented in one of our horizontal cross sections (to be published in the final field report).

15 The blocks of the *cella's* SW wall do not figure in my top views (figs. 5-6) because they are not visible above ground (see p. 391 with n.10).

Fig. 5. Palatine temple of Apollo; top view (left) and elevation views (right) of the remains with original surfaces and modern restorations colour-coded. Since its first excavation in the 19th c., the ruin underwent several restorations and additions (*b, e, f*). Original surfaces are mostly preserved only in the area of the *pronaos* and the E half of the *cella*. My reconstruction of the temple is shown in the background in grey in order to help readers unfamiliar with the structural evidence to better comprehend the situation.

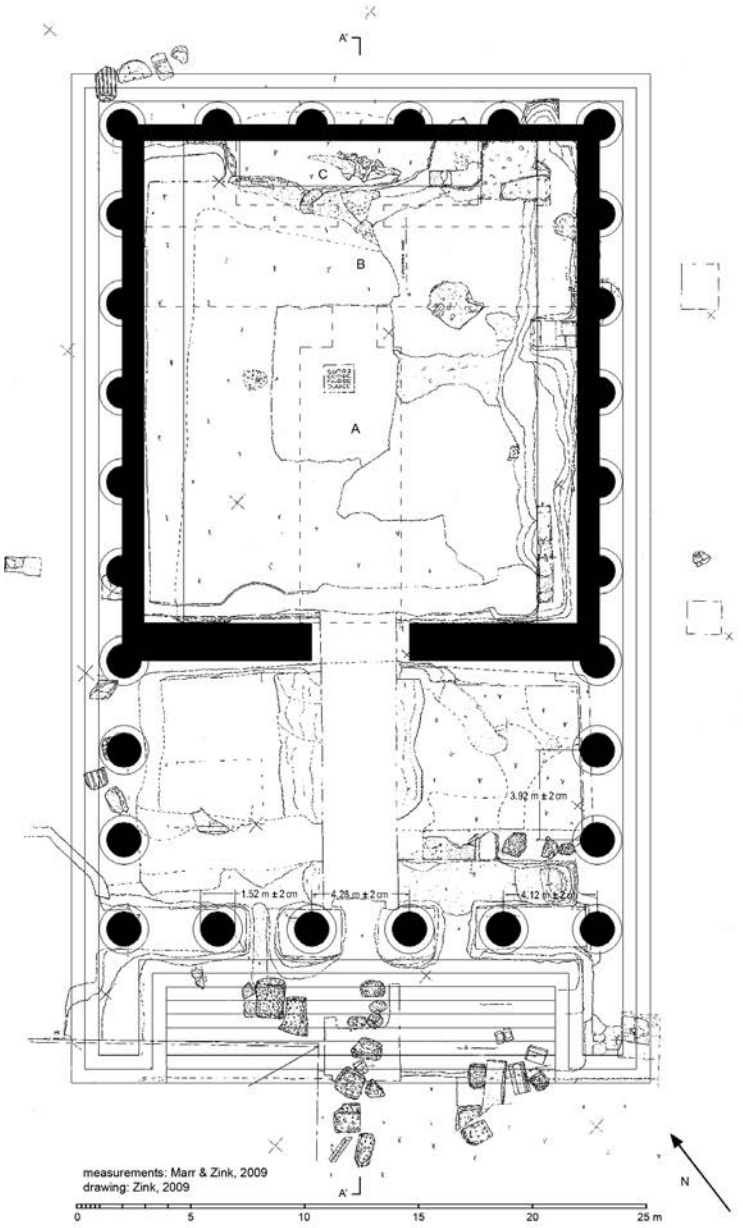

Fig. 6. Palatine, temple of Apollo, plan of the remains with a reconstruction of the temple's plan, including the tunnels inside the podium of the *cella* (A, B, C, indicated in dotted lines). An analytical documentation of the extant foundations permitted the axial spacing of the columns to be established. The fragment of a full column drum provides the lower columnar diameter (cf. Zink 2008). A new result is the relatively short intercolumniation of the side columns, which now proves that the temple featured three different intercolumniations (front center, front regular, and sides).

voids.[16] My documentation of these voids shows that both their asymmetrical form and their arrangement depended on walls of earlier structures which were integrated into the *pronaos* foundations.[17] The voids were then backfilled and covered with concrete vaults in order to save building material in a zone that had no particular load-bearing function.

Crypt (cf. figs. 3, 6-7 both at *A-C*): The podium of the *cella* contains a series of vaulted tunnels.

16 Claridge 143, referring to the voids in the SW sector in general.

17 I will treat the structures that preceded the temple in a separate report forthcoming in *RömMitt*.

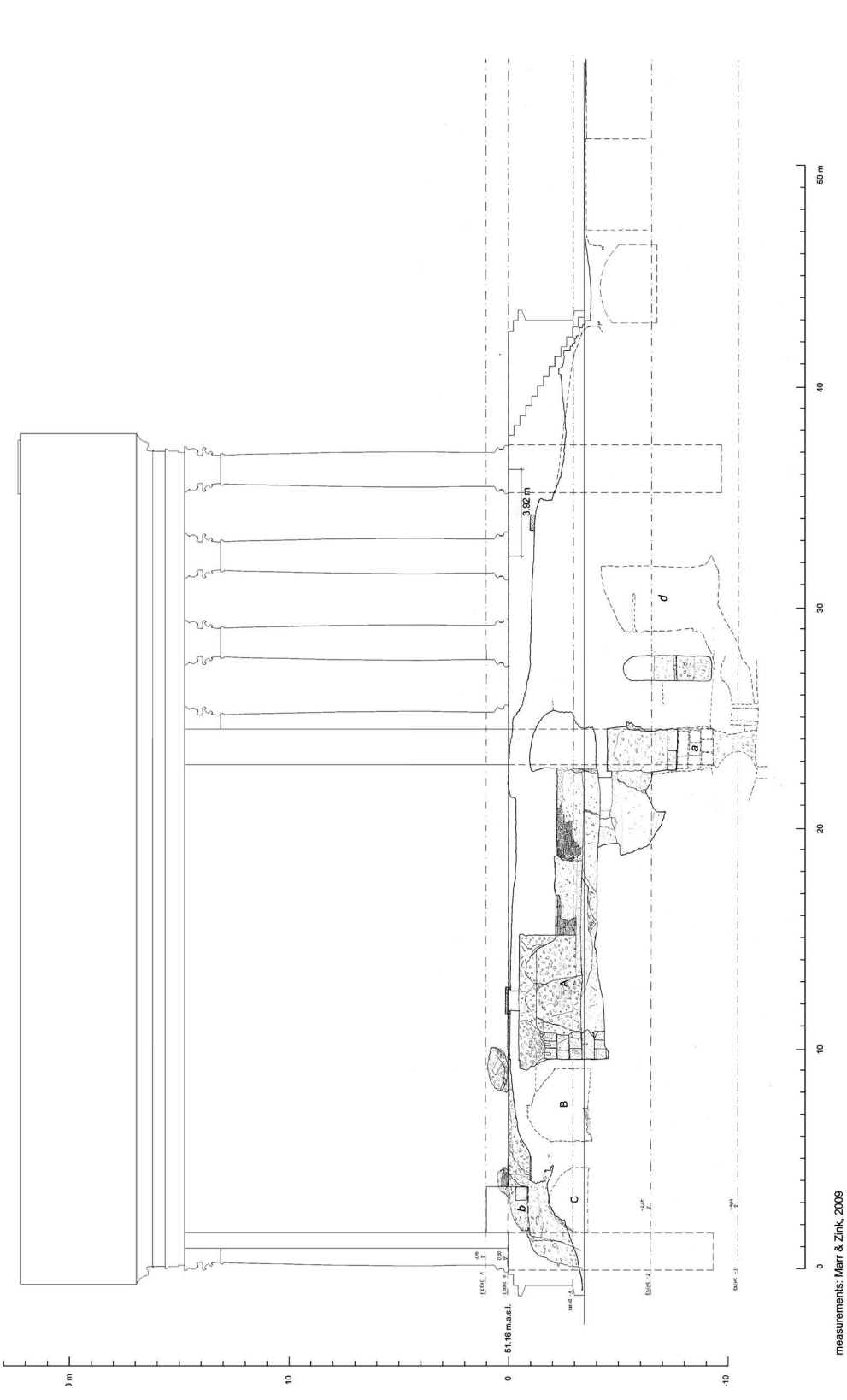

Fig. 7. Palatine, temple of Apollo, longitudinal section (A'-A' in fig. 6) through the foundations of the *cella* and the podium, with a schematic reconstruction of the temple's elevation (after Zink 2008). The drawing shows the remains of the ashlar walls, which supported the SW *cella* wall (*a*), as well as the foundations for frontal columns (outlined). The podium of the *cella* contains three tunnels (A, B, C), which were connected and probably formed the crypt. The northernmost tunnel (C) was located under the base for the cult statues (*b*).

Fig. 8. Palatine, temple of Apollo, view along the NW side of the *cella* foundations (i.e., the rear of the temple). In the foreground is a tunnel of the temple's crypt (cf. fig. 7 at *C*) with a fragment of its collapsed vaulted ceiling (*a*) sticking out of its fill. Both a recess (*b*) above the tunnel and a correctly restored block inside it (*c*) indicate the location of the base for the cult statues.

Fig. 10. E corner of the *cella* (view from southeast) with the recess for the foundations of the interior colonnade (*a*); the remains of its foundation blocks (*b*); and a late-antique brick construction (*c*) covered by modern restoration. The brickwork rests on the spot foundations inserted into the corners of the *cella* (cf. fig. 9 at *a*), and therefore probably represents the scanty remains of pillars that supported a concrete ceiling constructed during late antiquity. The fact that the brickwork (*c*) also builds over the foundations of the interior colonnade (*b*) suggests that the latter was removed for the construction of the new ceiling.

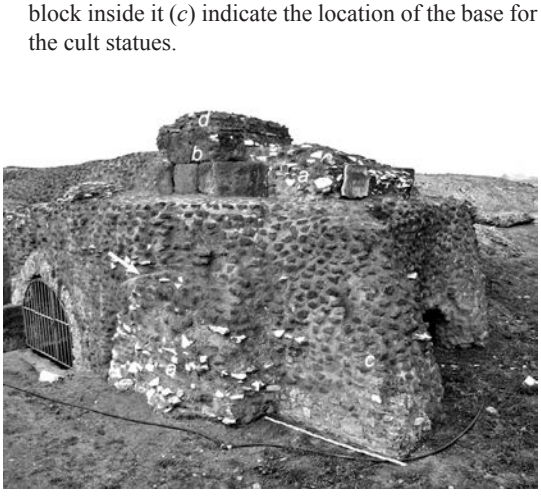

Fig. 9. E corner of the *cella* foundations from the east (left) and northeast (right). P. Rosa's substantial restorations and additions in this area reflect his correct understanding of the ruin's structural logic. A modern seamline (arrow) indicates the vault of a tunnel inside the podium (cf. fig.7 at *C*, fig. 8) while a massive addition in modern *opus caementicium* (*c*) shows the original extension of the ashlar foundations that once supported the *cella* wall and its engaged columns. Original surfaces in this area include the foundation blocks for the interior colonnade (*b*); the late-antique spot foundations (*a*) that were inserted into the tunnel (in the right image note the window created to display the spot foundations); and the remains of brickwork (*d*) above the spot foundations.

G. Lugli believed that they served to economize building material, while Claridge recently interpreted the NE tunnel as the trench for the temple's columnar foundations (a key argument for her theory that the temple faced northeast).[18] My documentation of the podium revealed that these tunnels belonged to a rather elaborate system of interconnected spaces, probably the temple's crypt. It featured a longitudinal tunnel (A), which opened up in a large room that was connected to two smaller, transverse tunnels (B, C):

- Tunnel A: The W side of this tunnel was heavily restored in modern times, but the original part shows a relatively low vault, opening up towards the north in a high room with a flat ceiling (the present concrete ceiling is modern, but the springer zone of the ancient ceiling is preserved). The connection to tunnel B is lost but it was probably located in a part of the NE wall that is now obstructed by modern restorations.
- Tunnel B: The entire W half of this tunnel is blocked by a modern retaining wall but its vault is well preserved in the E part. Its original floor level must have been above the remains of a mosaic floor and an ashlar wall which belong to a Late Republican structure which preceded the temple.[19]
- Tunnel C: This relatively narrow tunnel forms the NE end of the crypt. Its vaulted ceiling is now mostly collapsed but surface cleaning in the central axis of the corridor brought to light the remains of its connection to tunnel B.

The original entrance to the crypt must have been located in the interior of the *cella*, since both the ashlar masonry of the *cella* walls and the columnar foundations would have blocked any access from the exterior.[20] One may have gained entry to the crypt via a staircase located in front of the cult statues, but since large parts of the *cella* floor are modern reconstructions the precise location of the entrance to the crypt remains unknown.

The crypt's northernmost tunnel (C) was located precisely under the foundations of the cult statue base, as is clear in the section of the temple along its length (fig. 7 at *b*, C).[21] This layout provides the key for assessing the function of the crypt, which seems to have been related to the Sibylline oracle housed in the temple. A passage in Suetonius (*Aug.* 31), mentions that the Sibylline books were stored *under* the cult statue base of the Palatine temple of Apollo, more specifically in "… *duobus forulis auratis sub Palatini Apollinis basi*". The important word for understanding the precise location of the Sibylline books within the temple is *forulus*. There is another instance (Juv. 3.219) of the use of this word in connection with books, and the *OLD* therefore translates *forulus* as "a shelve or collection of shelves for books", leading to the general assumption that the texts were stored *inside* the statue base.[22] However, *forulus* is a diminutive of the word *forus*, which means 'a narrow passage' or a 'gangway'.[23] It is therefore possible that the Sibylline books were stored in the two transverse tunnels inside the podium of the *cella*, which were located under

18 See Lugli 33; Claridge 142: "If Vitruvius is right, however, the Palatine building was only four columns wide, with which the spacing of the voids in the concrete on the NE side would seem to agree."

19 See also Carettoni 69.

20 An exterior entrance via tunnel B is unlikely since the tunnel is not in axis with an intercolumniation (the entrance would have been off-centered, which would pose a problem in accessing a relatively narrow vaulted tunnel).

21 This is also feasible from a structural point of view; in order to withstand the load of the cult statues and their base, the concrete vaulted ceiling of tunnel C was more massive than those of tunnels A and B.

22 Most recently, Claridge 143.

23 *OLD* 1984, 728 *s.vv. forulus*; *forus.*

the temple's cult statues, just as Suetonius says. Another literary reference to the temple's oracular crypt is found in Vergil (*Aen*. 6.69-71), where Aeneas promises Sibyl to dedicate a marble temple to Apollo and, for the priestess, a *magna … penetralia* (a noble inner shrine).

Late-antique modifications

My documentation of the *cella* foundations also brought to light a previously unknown late-antique construction phase which entailed a complete renewal of the *cella*'s interior and its ceiling. Key evidence for this are several spot foundations in concrete strategically inserted into the *cella*'s corners from its interior to support massive brick pillars to absorb the load of a new concrete ceiling, a fragment of which is still visible on top of the *cella* podium (cf. figs. 1, 3-5). Following Lugli, I had thought[24] that the spot foundations in the corners of the *cella* were part of the foundations for the interior colonnade, but my complete documentation now shows that they were a later addition. Construction seam lines indicate this; their concrete differs from other parts of the foundations since it contains as aggregate large amounts of white and coloured marble pieces, among them many chunks of smashed monumental marble architecture. At the NE side of the *cella*, the spot foundations were inserted into tunnel C of the crypt, thus reducing its size (cf. fig. 9).

A few remains of a brick structure preserved on top of the spot foundations in the E corner of the *cella* probably represent the remains of a pillar (cf. figs. 5-10). The bricks rise on top of the ashlar foundations of the podium of the interior colonnade, thus suggesting that the colonnade was removed for the construction of the new ceiling (cf. fig. 10). In fact, the concrete of the spot foundations at the S corner of the *cella* contains a fragment of a relatively large column drum in white marble (fig. 11), which could be a fragment from the *cella's* interior order, recycled in the concrete of the spot foundations together with other pieces in coloured marble. The massive brick pillars inserted into the corner of the *cella* suggest that the new ceiling was concrete-vaulted, either a groin- or a barrel-vault combined with arches at each end of the *cella* (the S arch would have spanned the cult images).[25] To judge by the type of brickwork, the installation of the new ceiling can be dated to about the late 3rd/early 4th c.[26] This was probably the last substantial renewal because the temple burned down com-

Fig. 11. Palatine, temple of Apollo, S corner of the *cella* foundations; detail of the aggregate material used to construct the spot foundations that were inserted into the corners of the *cella* in the late-antique period. Their concrete contains many smashed pieces of monumental architecture in white and coloured marble. Among them also is the fragment of a large, fluted column, perhaps one of the columns of the temple's interior order (which was torn down for the construction of the spot foundations: cf. fig. 10).

24 Lugli 35, followed by Zink 49 and 57, fig. 11.

25 I owe this point to A. von Kienlin (Swiss Federal Institute of Technology, Zurich).

26 This date is based on the expertise of E. Bukowiecki (Université de Provence) who kindly visited the site to investigate the remains. A full documentation of the brick work will be presented

pletely on March 19, 363, and seems not to have been rebuilt thereafter. The Sibylline books that were stored in the crypt were, however, rescued.[27] The fact that the books were kept inside the temple until its demise indicates that the Palatine temple was never used as a Christian church, even after the late-antique renewal of its *cella*.

Construction, function, design — and orientation

My documentation of the temple brings new insights into its plan and functional meaning, while also confirming many results of earlier scholarship. The critical element of my approach is on-site architectural documentation, which entails close observation of the remains, leading to a better understanding of both ancient construction and modern restorations and thus of the temple's original plan and subsequent phases.

The new plan refines our knowledge on the temple's complex design while adding to the spectrum of design solutions in Augustan temples. In addition to a widened central intercolumniation of the front (a common design variant of its time), the temple now shows a relatively short columnar spacing at the flanks.[28] The shortening of the lateral columns' axial width was probably a necessity related to the constrained space of the construction site, delimited to the N by the structure generally known as the "House of Livia". A similar lack of space may have caused the shortening of the lateral intercolumniations at the temple of Mars Ultor (2 B.C.), which stands as the only other known Augustan temple in Rome with a shortened spacing on its sides.[29]

New information is also available on the organization of the *cella* at different periods. During the Augustan period (and probably also thereafter), it seems to have been equipped with a columnar order that stood on a podium along its sides. This was probably taken down around the end of the 3rd/beginning of the 4th c., when the *cella* was furnished with a concrete vaulted ceiling. During all periods, a long base for the cult statues of Apollo, Diana and Latona stood at the NE end of the *cella*. The relief on the Early Imperial "Sorrento base" in all likelihood shows the temple's cult triad, with Apollo holding a kithara, hence as *vates* (prophet).[30] In this function he had dictated the Sibylline ver-

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in my final publication. On Bukowiecki's method for the dating of Palatine brickwork see her forthcoming dissertation *La brique dans l'architecture impériale à Rome. Quelques grands chantiers du Palatin* (*Université Aix-Marseille* I, 2008). For a recent synthesis see "La taille des briques de parement dans l'opus testaceum à Rome," in S. Camporeale, H. Dessales and A. Pizzo (edd.), *I cantieri edili dell'Italia e delle province romane,* 2: *Italia e province occidentali* (Workshop di Siena, Certosa di Pontignano 2008; Anejos de ArchEspArq 57, 2010) 143-51.

27 Amm. Marc. 23.3.3.

28 Widened intercolumniation of the front (both *c.*1 Roman foot): for the Augustan Pantheon, see L. Haselberger, "*Debent habere gravitatem*. Pyknostyle Säulenstellung und augusteische Tempelbaukunst," *RömMitt* 110 (2003) 172; and now argued for the Temple of Castor based on the width of the *tabernae* below it: K. Aage Nilson and C. B. Person in S. Sande and J. Zahle (edd.), *The temple of Castor and Pollux* III. *The Augustan temple* (Rome 2008) 80 (fig. 4.4) and 83.

29 Its intercolumniation at the side was shortened for *c.*8 cm (a quarter-foot) in comparison to the front (compare the shortening by half a Roman foot at Apollo Palatinus): Haselberger ibid. 161 (relying on J. Ganzert's documentation). According to Nilson and Person (ibid. 80, fig. 4.4), the lateral intercolumniation of the temple of Castor and Pollux was slightly *larger* than that of the front; the temple of Castor supposedly also featured widened intercolumniations at the corners.

30 For Apollo *vates,* see Hor., *Carm*. 1.31; Verg., *Aen*. 6.12; Ov., *Ars Am.* 2.496; Lucan 5.85. In the left hand, the god may have held a *patera*. As others have pointed out, this was probably a reference to Apollo's expiation ritual after killing the earth dragon Python, guardian of the Delphic oracle.

ses,[31] which were probably stored in an oracular crypt located under the statue of Apollo. The crypt seems to have been accessible via a stairway in front of the statue. This functional layout can be compared to that of the Late Republican temple of Hercules Victor at Tivoli (*c.*89-82 B.C.) which also featured an oracular crypt under its *cella*.[32] The characteristic layout of the Palatine temple with an oracular crypt under its cult statues turns out to be key for the understanding of the temple's construction, design and function.

As to the temple's orientation, my fieldwork has confirmed what was thought before, that the temple faced southwest. In an attempt to reconcile earlier scholarship with Claridge's NE orientation, Wiseman (above) finally suggested an amphiprostyle arrangement of the temple's plan, as seen at the oracular temple of Apollo in Delphi. However, the layout of both *cella* and *pronaos*, as well as the location of the cult statue base, indicate clearly that the temple's s front was on its SW side; and the extant fragments of a half- and a three-quarter capital prove that it featured an engaged columnar order.[33] In sum, the archaeological evidence shows that the temple of Apollo was a pseudoperipteros oriented to the southwest. Wiseman's and my own simultaneous assessments of the literary and archaeological evidence respectively lead to contradicting results, showing us quite plainly, and rather painfully, the wide range of interpretations that various types of evidence can permit. Wiseman uses different types of texts (poetical, historical, religious, annalistic) to establish the temple's orientation, and, ultimately, to reconstruct no less than the historical topography of the entire SW Palatine.

However, the very point of departure for Wiseman's analysis remains Claridge's interpretation of the archaeological evidence. It may thus be worthwhile briefly recalling Claridge's structural arguments, which take up less than a page in her archaeological guidebook.[34] At the outset, she dismisses earlier reconstructions of the temple's plan by stating that they are "generally restored to match the other temple of Apollo beside the theatre of Marcellus". Turning to Vitruvius (3.3.4), who mentions an *aedes Dianae et Apollinis* as an example of a diastyle temple (hence with intercolumniations that were three times the lower columnar diameter), Claridge suggests that "the Palatine building was only four columns wide, with which the spacing of the voids in the concrete on the NE side would seem to agree". In support of a tetrastyle façade facing northeast, she also refers briefly to the 19th-c. staircase over the *pronaos*, which, according to her, seems to give a misleading impression of the temple's direction. The argumentation concludes with a brief look at the voids inside the temple's concrete foundations:

> The NE half has barrel-vaulted passages in its core, which suits the lighter weight of the front porch, whereas the voids in the SW half argue for more solid tufa construction, to bear the weight of the *cella* and its precious occupants.

The reconstruction of a monument from its fragmentary remains is, to a certain extent,

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For discussion on the cult image, see the excellent summary of A. Heil, "Princeps und *poeta* auf dem Palatin. Eine intermediale Analyse von Properz 2,31," in A. Haltenhoff, A. Heil and F.-H. Mutschler (edd.), *Römische Werte und Römische Literatur im frühen Prinzipat* (Berlin 2011) 69-71.

31 Cic., *Har. resp*. 18 (*Apollinis vatum libris)*; *Div*. 1.115 (*Apollinis operta*) and 2.113 (*vatibus Apollinis*); Val. Max. 1.1.1 (*Apollinis praedictiones vatum libris*); further, Tib. 2.5.15; Serv. Auct., *ad Aen*. 3.332.

32 See F. Coarelli, *I santuari del Lazio in età repubblicana* (Rome 1987) 91 fig. 28 (after Giuliani 1970), for a plan and the textual evidence on use of the temple of Hercules Victor as oracular site.

33 Zink 49-50, fig. 3; for the first, excellent documentation of the capital fragments, on which I also rely, see H. Bauer, "Das Kapitell des Apollo Palatinus-Tempels," *RömMitt* 76 (1969) 183-204.

34 The following paragraph aims to summarize Claridge 142-43.

always a 'house of cards', but Claridge's house seems particularly unstable in its construction. Her statement that earlier scholarship used the temple of Apollo Sosianus as an analogy to reconstruct the plan of Palatine Apollo is not correct.[35] I have demonstrated that the voids within the temple's foundations functioned not only as foundation holes, but also as a crypt, while the irregular layout of other voids in the *pronaos* was not a matter of pure practicality but features dictated by the earlier remains on the site. My assessment of the temple's restorations against its original surfaces now shows that the 19th-c. restorations, while significant for the modern appearance of the ruin, were carried out with a very good understanding of its structural logic. As to Vitruvius' statement (3.3.4), which plays a prominent rôle in Claridge's argument, we have to remind ourselves that it is far from certain whether the passage refers to the Palatine temple of Apollo, especially since other sources never refer to it as *aedes Apollinis et Dianae*. Vitruvius may perhaps have had in mind the pre-Augustan temple of Apollo Sosianus, as P. Gros has argued though not without difficulties;[36] or, following an old but still legitimate suggestion of F. Castagnoli, he may have referred to a third temple of which we have no other evidence.[37] We are thus not in a position to connect Vitruvus' statement to a specific structure. One thing, however, is clear from archaeological evidence: the exterior columnar order of Apollo Palatinus does not fall under Vitruvius' diastyle category.

But how are we to reconcile the literary sources that Wiseman has brought forward with the temple's now practically-certain SW orientation? The solution will lie in a more contextual study of the SW Palatine, one that brings together topography, geology, geomorphology, archaeology, historical building research (*Bauforschung*), history, literature, and iconography all at once. It is only by balancing the full spectrum of the evidence that we can achieve a more satisfactory understanding of the larger topographical issues that are at stake. In this sense, Wiseman's masterful study of the literary evidence and my own analytical documentation of the structural remains represent only the beginning of a more complex study which remains to be carried out.

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35 Neither Lugli nor I reconstructed the plan of Apollo Palatinus in analogy to Apollo Sosianus, although we both (cf. Lugli 45) noticed the close similarities in both plan and specific measurements. I have referred to Apollo Sosianus for my reconstruction of the column *height*, which is justified by the fact that the two temples show identical lower column diameters and capital heights; but this argument is independent from my reconstruction of the plan (see Zink 60).

36 P. Gros, *Vitruve de l'architecture. Livre III* (Paris 1990) lxxxi; and id., *Aurea templa* (BEFAR 231, 1976) 214.

37 F. Castagnoli, *BullCom* 74 (1951/52) 54. For a short summary of the discussion, see Haselberger (supra n.28) 159 and 170.